

Is scientific knowledge enough? Considerations on sediment management.

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Sediment management: Littoral sediment budget is the balance between sediment volume entering and leaving a particular section of the coast. Sediment budget analysis consists on the evaluation of sediment fluxes and in the identification of the sources and sinks that give rise to additions and subtractions within a sediment cell. There are several examples worldwide where human interference in the coastal system has been the main responsible for the disruption of the equilibrium leading to severe erosion problems. Dredging or sand exploitation are examples of activities that have subtracted large amounts of sediments to the coastal system.

For more than a half a century, the scientific community has recognized the relevance of the sediment budget in coastal evolution. However, coastal management approaches that integrate the sediment budget analysis are relatively recent. In fact several countries that face severe erosion problems lack the adoption of an integrated sediment management approach. The time lag between the recognition by the scientific community that the sediment budget plays a fundamental role in the coastal evolution, and the adoption of practical management actions to restore sediment budget equilibrium is surprisingly large. This time lag has strong implications in the sustainable development of the coast since the adoption of a regional sediment budget potentially improves the environment, allows use of natural processes to solve coastal problems and, ultimately, saves money [1].

Is scientific knowledge enough? Research community shares the consensus in the diagnostic of the problem, that coastal erosion is essentially related to a sedimentary deficit. However, in what concerns to problem solving, traditionally there are two main schools of thought: while one advocate the use of hard protection measures, others favor the adoption of soft measures. This disagreement is mostly related with a traditionally, monodisciplinary, view of the problem that encompasses only a technical perspective. With the development of integrated coastal zone management practices, it became clear that the sustainable coastal development must be supported in the equilibrium of social, economic and environmental values. This adds to the physical dimension of the problem other disciplines that must be considered in order to achieve an optimal solution. This necessary implies a scientific-based compromise

that has to be achieved by a consensus between researchers with different backgrounds. Regional sediment management arises as one of the most consensual approaches to coastal erosion [2]. However, finding the solution does not guaranty its implementation because it has to be put in practice by coastal managers.

Get the message across - from idea to implementation: In order to adopt a scientific-based decision-making approach to the coastal erosion problem, it is necessary to transfer scientific knowledge to coastal managers. To foster this process it is necessary not only “to deliver” the solution to coastal managers, but also to assure their engagement by sharing the motivations and effects of the proposed solution, as well as the consequences of the alternatives. In this process, it is necessary to adopt a common language and use the most adequate channels to get the message across. Although the engagement of coastal managers is a fundamental piece in moving forward sediment management, it is important also to acknowledge that this procedure should be regarded as political process. In fact, the implementation of coastal measures very often depend on the interaction between society - public opinion - and political leaderships and institutions. The growing influence of society in the definition of strategic coastal development must be acknowledge and a new paradigm should be accepted: to get the message across, the research community has not only to devise sound technical solutions, but also to effectively communicate with coastal managers as well as with society as a whole.

References: [1] USACE (US Army Corps of Engineers) (2014) *Regional Sediment Management Program*. In: <http://rsm.usace.army.mil>; [2] van Rijn (2010) *Coastal erosion control based on the concept of sediment cells*. Concepts and Science for Coastal Erosion Management Project. D13a.